

## Medical Science

### To Cite:

Razzaq T, Wajid F, Rafique S, Naveed M, Saadat S, Afzal A, Shoaib A, Aslam A, Rehman T, Atif A, Awais M. Knowledge, attitude and perception associated with Complementary and Alternative Medicine among future health care providers: A cross-sectional assessment in a private medical college in Lahore. *Medical Science* 2024; 28: e64ms3360 doi: <https://doi.org/10.54905/disssi.v28i148.e64ms3360>

### Authors' Affiliation:

<sup>1</sup>Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan

<sup>2</sup>Research Student, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan

<sup>3</sup>Head Pharmacy Services, Ghurki Trust Teaching Hospital (GTTH) and Assistant Professor (adjunct) Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan

### \*Corresponding Author

Head Pharmacy Services, Ghurki Trust Teaching Hospital (GTTH) and Assistant Professor (adjunct) Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan

Email: mowais126@gmail.com

### Peer-Review History

Received: 25 March 2024

Reviewed & Revised: 29/March/2024 to 15/June/2024

Accepted: 19 June 2024

Published: 27 June 2024

### Peer-review Method

External peer-review was done through double-blind method.

Medical Science

pISSN 2321-7359; eISSN 2321-7367



© The Author(s) 2024. Open Access. This article is licensed under a [Creative Commons Attribution License 4.0 \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.



# Knowledge, attitude and perception associated with Complementary and Alternative Medicine among future health care providers: A cross-sectional assessment in a private medical college in Lahore

**Tabinda Razzaq<sup>1</sup>, Fatima Wajid<sup>2</sup>, Sumbal Rafique<sup>2</sup>, Muneeba Naveed<sup>2</sup>, Shanza Saadat<sup>2</sup>, Atera Afzal<sup>2</sup>, Ammara Shoaib<sup>2</sup>, Aiman Aslam<sup>2</sup>, Talha Rehman<sup>2</sup>, Ayesha Atif<sup>2</sup>, Muhammad Awais<sup>3\*</sup>**

## ABSTRACT

Despite all conventional medicines, the use of complementary and alternative medicines (CAM) is increasing in the world. The objective of the current study is to analyze the knowledge, attitude, and perception regarding CAM among pharmacy, medicine, and dental students. A cross-sectional study was conducted at a private medical college using a validated questionnaire. The total sample size of this study was 268 from medicine, dental, and pharmacy faculty. The pharmacy, dental, and medicine students have better knowledge and perception with positive attitudes regarding CAM. Knowledge about CAM has a direct relation with the place of study ( $p$ -value= $<0.001$ ) and participants who have healthcare providers in their families ( $p$ -value= $0.001$ ). All variables related to attitude are measured in scores, and then the mean attitude is calculated. A significant association is present between the practice of CAM in the Year of study. This study concluded that participants have better knowledge and practice with positive attitudes regarding CAM. Male' participant has more knowledge about CAM. Final-year students have the maximum mean attitude. Participants who have a healthcare provider in their family exhibit high practice scores.

**Keywords:** Complementary and alternative medicines (CAM), World Health Organization, COVID-19, healthcare providers

## 1. INTRODUCTION

CAM refers to complementary and alternative medicines. According to the World Health Organization, CAM includes therapies such as herbal therapy, traditional medicines, and non-conventional medicines (WHO, 2019). Some people do not believe in conventional medication and go with CAM to treat several diseases (Mortada, 2024). Due to low reporting side effects, patients who have cardiovascular diseases, considered CAMs over complementary medications; however, no evidence of safety and efficacy was found (Paoloni et al., 2022). Usually, males aged above 65 often use CAM mainly for arthritis and musculoskeletal pains (Sharp et al., 2018). For arthritis, CAM includes osteopathy for the relaxation of the musculoskeletal system, chiropractic for the spine, and massage (Bhoi et al., 2021).

The prevalence of CAM is too high in different countries of the world (Lee et al., 2022). In Brazil, the prevalence of CAM therapy is approximately 4.5% (De-Moraes-Mello-Boccolini and Siqueira-Boccolini, 2020). Globally, the use of CAM therapy for diabetic patients is 51% (Alzahrani et al., 2021). The usage of CAM in stroke patients is shallow, and non-compliance with medication (Rajahthurai et al., 2022). 25.9% of the general population used CAM during 2017-2018, while in Germany, approximately 40% of the population utilized CAM therapy (Kemppainen et al., 2018). One out of every two cancer patients in Southeast Iran, uses CAM for treatment, indicating a high prevalence of CAM use among cancer patients in the region (Dehghan et al., 2019). Globally, CAM therapy is enhanced during COVID-19 for treatment, prevention, and symptomatic relief (Paudyal et al., 2022).

During the COVID-19 outbreak, the majority of people using Complementary and Alternative Medicine (CAM) therapies (61.3% of dietary supplements, 48.8% of herbal medicines, and 57.9% of prayer as a form of therapy) (Dehghan et al., 2022). Certain stable herbal medicines are being used to treat COVID-19, with patients believing that these herbs can prevent or cure the disease (Nugraha et al., 2020). The QOL of cancerous patients decreased due to the use of CAM along with conventional drugs without informing the healthcare provider (Ashrafizadeh and Rassouli, 2024). CKD patients on both traditional medication and CAM suffer from severe side effects and worsening of the condition (Tsai et al., 2024). Chinese Patent medications for diabetes mellitus show hypoglycaemic effects but are still not considered in use with conventional drugs (Zheng et al., 2024). People have false beliefs about treatment with CAM and other allopathic medicines that show no side effects (Alzahrani et al., 2024).

In Indonesia, Jamu, a local holistic drink, traditionally used by the population to enhance physical strength and mental health (Febrianto et al., 2023). UTIs, GIT infections, dermal infections, protozoa-related infections, and viral and bacterial infections are also treated by Alternative and Herbal medications (Chaughule and Barve, 2024). Despite suffering from Avian coccidiosis infection, poultry broiler chickens have been successfully treated with *Glycyrrhiza glabra* and *Echinacea purpurea* (Ghafouri et al., 2023). Females suffering from polycystic ovarian syndrome have treatment paved in herbal medicines (Chouhan and Garg, 2023). The objective of current research is to assess the knowledge, attitude, and perception of healthcare professionals toward CAM. As CAM usage continues to increase daily, this study aimed to determine its significance and importance among future healthcare providers.

## 2. METHODOLOGY

A cross-sectional study was conducted at a private medical college to evaluate CAM knowledge, attitude, and perception among 3rd year, 4th year, and 5th year students of medicine, dental, and pharmacy faculty. The cross-sectional study was conducted by using a validated questionnaire. This study was conducted from 25th October 2022 to 25th October 2023. The primary outcome of this study is to evaluate future healthcare professionals' knowledge, attitudes, and perceptions toward CAM at private medical colleges. A total sample size of 268 students: 100 from the pharmacy department, 83 from the medicine department, and 85 from the dental faculty. All the students willing to participate in the study, and complete the Questionnaire distributed to them. The 1st and 2nd year students of pharmacy, dental, and medicine departments from private medical colleges were excluded from this study.

Physiotherapy and allied health sciences students at private medical colleges were also excluded from the present research. A validated questionnaire was collected to check knowledge, perception, and attitude on CAM in future healthcare providers. Participants' demographic information includes faculty, year, gender, residence, and healthcare provider in their family. This demographic information is in the form of categorical data. The questionnaire has four main parts. The first part of the Questionnaire is the consent form, which includes the objective of this study with respondents' demographic information. The questionnaire's second part is based on knowledge outcomes about CAM. The knowledge may be adequate or inadequate.

The third part is related to attitude toward CAM, and the mean attitude may be negative, neutral, or positive. The last part of the questionnaire is about the perception/practice of CAM. The practice of CAM in students may be good, fair, or poor. A review committee of a private medical college grants current research. This approval includes a permission letter to collect all respondents' demographic information. After reviewing all aspects, the ethical research board granted clearance. The ethical approval number for current research is ZI/09/22.

Statistical Analysis

The collection of data from the participants of the study, with the help of a validated questionnaire. The categorical data was obtained. In this study, p-value <0.005 was considered statistically significant. The novelty of the data was analyzed by using the Kolmogorov-Smirnov test, kurtosis, and skewness. Chi-square and Fisher's exact test are used to evaluate the categorical data statistically. The effect size of data was checked using the Cramer V rule and phi square.

3. RESULTS

The current study included 268 participants. About 69% of respondents live in hostels. Approximately 68.3% of females participated in this study. Table 1 mentions further information on the demographics of participants.

Table 1 The participant's demographic information.

Variables	N%
FACULTY	
Pharmacy	100 (37.3)
Medicine	83 (31.0)
BDS	85 (31.7)
YEAR OF STUDY	
3rd Year	95 (35.5)
4th Year	130 (48.5)
5th Year	43 (16.0)
GENDER	
Male	85 (31.7)
Female	183 (68.3)
RESIDENCE	
Hosteller	185 (69.0)
Non-hosteller	83 (31.0)
HEALTH CARE PROVIDER IN THE FAMILY	
Yes	53 (19.8)
No	215 (80.2)

The dental student has adequate knowledge (35.3%) of CAM. The male participants have more knowledge about CAM (38.8%) than the females. Table 2 provides more information about the knowledge regarding CAM. Pharmacy students have a positive attitude (68.0%) regarding CAM. The participants who are living in the hostel show an 80.0% positive attitude toward CAM in comparison with non-hosteller students. Further information on mean attitude on CAM is given in (Table 3).

**Table 2** Knowledge of participants.

Variables	Adequate	Inadequate	P-value
FACULTY			
Pharmacy	28 (28.0)	72 (72.0)	0.362
Medicine	31 (37.3)	52 (62.7)	
BDS	30 (35.3)	55 (64.7)	
YEAR OF STUDY			
3rd Year	32 (33.7)	63 (66.3)	0.902
4thYear	44 (33.8)	86 (66.2)	
5thYear	13 (30.2)	30 (69.8)	
GENDER			
Male	33 (38.8)	52 (61.2)	0.183
Female	56 (30.6)	127 (69.4)	
RESIDENCE			
Hosteller	49 (26.5)	136 (73.5)	<0.001
Non-hosteller	40 (48.2)	43 (51.8)	
HEALTH CARE PROVIDER IN THE FAMILY			
Yes	7 (13.2)	46 (86.8)	0.001
No	82 (38.1)	133 (61.9)	

**Table 3** Mean attitude of participants.

Variables	Negative	Neutral	Positive
FACULTY			
Pharmacy	23 (23.0)	9 (9.0)	68 (68.0)
Medicine	1 (1.2)	5 (6.0)	77 (92.8)
BDS	3 (3.5)	3 (3.5)	79 (93.0)
YEAR OF STUDY			
3rd Year	20 (21.0)	9 (9.5)	66 (69.5)
4thYear	7 (5.4)	8 (6.2)	115 (88.4)
5thYear	0 (0.0)	0 (0.0)	43 (100.0)
GENDER			
Male	6 (7.1)	8 (9.4)	71 (83.5)
Female	21 (11.5)	9 (4.9)	153 (83.6)
RESIDENCE			
Hosteller	23 (12.4)	14 (7.6)	148 (80.0)
Non-hosteller	4 (4.8)	3 (3.6)	76 (91.6)
HEALTH CARE PROVIDER IN THE FAMILY			
Yes	0 (0.0)	4 (7.5)	49 (92.5)
No	27 (12.6)	13 (6.0)	175 (81.4)

The 5th year students have good practice (27.9%) on CAM. The respondents having a healthcare provider in their family show 11.3% good practice towards CAM. Detailed information on practice is given in (Table 4).

Table 4 Practice of participants.

Variables	Good practice	Fair Practice	Poor Practice	P-value
FACULTY				
Pharmacy	8 (8.0)	83 (83.0)	9 (9.0)	0.298
Medicine	12 (14.5)	63 (75.9)	8 (9.6)	
BDS	16 (18.8)	61 (71.8)	8 (9.4)	
YEAR OF STUDY				
3rd Year	10 (10.5)	79 (83.2)	6 (6.3)	0.014
4thYear	14 (10.8)	103 (79.2)	13 (10.0)	
5thYear	12 (27.9)	25 (58.1)	6 (14.0)	
GENDER				
Male	14 (16.5)	64 (75.3)	7 (8.2)	0.584
Female	22 (12.0)	143 (78.2)	18 (9.8)	
RESIDENCE				
Hosteller	25 (13.5)	145 (78.4)	15 (8.1)	0.590
Non-hosteller	11 (13.3)	62 (74.7)	10 (12.0)	
HEALTH CARE PROVIDER IN THE FAMILY				
Yes	4 (7.5)	43 (81.2)	6 (11.3)	0.347
No	32 (14.9)	164 (76.3)	19 (8.8)	

4. DISCUSSION

The result of current research shows that dental students have adequate knowledge (35.3%) compared to the other facilities because dental students are well aware of CAM. The p-value of (0.362) indicates a non-relationship between faculty and knowledge of CAM. A study conducted in Saudi Arabia, in 2017, contrast with the present study's results (Ahmad et al., 2017). The dental faculty show a positive attitude towards CAM (92.9%) compared to participants from other faculties. Dental students have more believe in the effectiveness of CAM. The study conducted in Sierra Leone, in 2014, contrast with current research findings (James and Bah, 2014). Students from the department of dentistry show good practice (18.8%) in comparison with other department students. BDS students mostly use CAM to treat patients. The p-value of 0.298 shows a non-significant association between practice on CAM and the faculty variable. A similar study conducted in New Zealand, in 2020, contrast with the present survey findings (Liu et al., 2021).

The current study's findings reveal that the adequate knowledge of fourth-year students is 69.8% compared with the 3rd-year and 5th-year participants. The fourth-year students recently studied CAM. The p-value of 0.902 indicates a non-significant relationship between the year of study and knowledge about CAM. The study conducted in Turkey in 2015 was similar to the current study's findings (Yurtseven et al., 2015). The final-year students exhibited a 100.0% positive attitude towards CAM compared to 3rd year and 4th-year students. The probable reason is that final-year students are future healthcare providers. A study conducted in Sierra Leone, in 2015, aligned with the present study results (James et al., 2016). The 3rd year students show fair practice, with a percentage of 83.2%, whereas the final-year students have good practice, with a percentage of 27.9%. The p-value of 0.014 indicates a direct relation between the year of study and practice on CAM. As the level of education increases practice on CAM will also enhance. A previous study conducted in Spain, in 2020, similar to this survey's findings (Vankova, 2022).

The results show that males have adequate knowledge about CAM (38.8%) compared to females (30.6%). With a p-value of 0.183, the study's outcome is statistically insignificant, with no direct relation between gender and knowledge about CAM. The study conducted in 2016, at King Abdulaziz University, Saudia Arabia, contrasts the current findings. Female respondents show positive attitudes towards CAM (83.6%) compared to male respondents (83.5%). Female students are more likely to use CAM personally. The study conducted in 2006, at the University of Birmingham, UK, aligns with our current findings (Greenfield et al., 2006). The female students show fair practice with a rate of 78.1, while the male students show good practice with a rate of 16.5. The p-value of 0.014 is statistically significant and indicates the relationship between the practice of CAM and gender. The study conducted in 2020 in Europe is in line with this study's findings.

The current study findings indicate that non-hostellers have adequate knowledge, with a percentage of 48.2%. The p-value is less than 0.001, showing the direct relation between the place of study and knowledge regarding CAM. The reason behind this is that non-hostellers have more time to meet the people than hostellers. The study conducted in Ohio Appalachia, in 2012, is similar to this study's findings. The mean attitude of the non-hostellers regarding CAM is more favorable (91.6 %) than that of hostellers. The non-hostellers' participants are more engaged with society. The study conducted in Saudia, in 2017, contrasts the present research findings. Hostellers exhibit a good practice of 13.5% compared to non-hostellers, with a p-value of 0.590. This p-value indicates the non-significant association between the place of study and the practice of CAM. The hostellers have more time to study CAM. The study conducted in India, in 2015, aligns with the current research results (Roy et al., 2015).

The findings of our study indicate that healthcare professionals in of respondents show adequate knowledge (86.8%) about complementary and alternative medicines. There is a significant relation with a p-value of 0.001 the significant association present between knowledge of CAM and having a healthcare provider in the family. Healthcare professionals have more knowledge about medicines. The result of the study is in contrast with a study conducted in 2017, in Trinidad and Tobago (Bahall and Legall, 2017). Healthcare providers in families show a positive attitude (92.5%) towards complementary and alternative medicine. Healthcare providers daily deal with different people. The results of the current study are consistent with those of a study conducted in 2021 in Mashhad Iran (Jafari et al., 2021). Healthcare professionals within family members show fair practice (81.1%) regarding CAM. The reason behind that is they have training in the field. There is a non-significant association with a p-value of 0.347, indicating no correlation present between having a healthcare provider in the family and the practice of CAM. A similar study conducted in 2020, in Saudia Arabia, is aligned with the current study findings (Khan et al., 2020).

## 5. CONCLUSION

The study concludes that participants have better knowledge and practice, with a positive mean attitude regarding CAM. Knowledge about CAM has a direct relation with the place of study and having a healthcare worker in the family. The final-year students show a 100% positive mean attitude regarding CAM. Practice on CAM has a significant association with the year of study.

### Author Contribution

All the author contributes equally, and the full manuscript is read by all the authors.

### Acknowledgement

We are grateful to all who contributed to the study.

### Funding

This study has not received any external funding.

### Conflict of interest

The authors declare that there is no conflict of interests.

### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

## REFERENCES

1. Ahmad R, Naqvi AA, Ahmad N, Baraka M, Mastour M, Al-Sharedah S, Al-Ghamdi S, Al-Rabae G, Al-Ghamdi MS. Awareness, Perception, Attitude, and Knowledge Regarding Complementary and Alternative Medicines (CAMs) Among the Pharmacy and Medical Students of a Public University in Saudi Arabia. *Arch Pharma Pract* 2017; 8(2):51-63. doi: 10.4103/app. app\_74\_16
2. Alzahrani AS, Greenfield SM, Shrestha S, Paudyal V. Views of healthcare professionals on complementary and alternative medicine use by patients with diabetes: a qualitative study.



- BMC Complement Med Ther 2024; 24(1):81. doi: 10.1186/s12906-024-04385-6
3. Alzahrani AS, Price MJ, Greenfield SM, Paudyal V. Global prevalence and types of complementary and alternative medicines use amongst adults with diabetes: systematic review and meta-analysis. *Eur J Clin Pharmacol* 2021; 77(9):1259-74. doi: 10.1007/s00228-021-03097-x
  4. Ashrafizadeh H, Rassouli M. Traditional, complementary, and alternative medicine in cancer care: Challenges and opportunities. *Asia Pac J Oncol Nurs* 2024; 11(1):100321. doi: 10.1016/j.apjon.2023.100321
  5. Bahall M, Legall G. Knowledge, attitudes, and practices among health care providers regarding complementary and alternative medicine in Trinidad and Tobago. *BMC Complement Altern Med* 2017; 17(1):144. doi: 10.1186/s12906-017-1654-y
  6. Bhoi D, Jain D, Garg R, Iyengar KP, Hoda W, Vaishya R, Jain VK. Complementary and Alternative Modalities (CAM) for pain management in musculoskeletal diseases (MSDs). *J Clin Orthop Trauma* 2021; 18:171-80. doi: 10.1016/j.jcot.2021.04.021
  7. Chaughule RS, Barve RS. Role of herbal medicines in the treatment of infectious diseases. *Vegetos* 2024; 37(1):41-51. doi: 10.1007/s42535-022-00549-2
  8. Chouhan P, Garg AK. Exploring The Therapeutic Potential of Herbal Intervention in Polycystic Ovary Syndrome: A Systemic Review and Meta-Analysis. *Migrat Lett* 2023; 20(S12):1308-1333. doi: 10.59670/ml.v20is12.8536
  9. Dehghan M, Ghaedi-Heidari F, Malakoutikhah A, Mokhtarabadi S. Complementary and alternative medicine usage and its determinant factors among Iranian patients with cancer. *World Cancer Res J* 2019; 6:e1382. doi: 10.32113/wcrj\_20199\_1382
  10. Dehghan M, Ghanbari A, Heidari FG, Shahrbabaki PM, Zakeri MA. Use of complementary and alternative medicine in general population during COVID-19 outbreak: A survey in Iran. *J Int Med* 2022; 20(1):45-51. doi: 10.1016/j.joim.2021.11.004
  11. Febrianto PT, Budiastuti A, Megasari LA, Prastiwi MI. Healthy behavior and herbal drink consumption among educated youth during COVID-19 pandemic. *Perilaku sehat dan konsumsi minuman herbal kalangan remaja terdidik selama pandemi COVID-19. Jurnal Sosiologi Dialektika* 2023; 18(1):12-20. doi: 10.20473/jsd.v18i1.2023.12-20
  12. Ghafouri SA, Ghaniei A, Tamannaei AE, Sadr S, Charbgoos A, Ghiassi S, Abuali M. Evaluation of therapeutic effects of an herbal mixture (*Echinacea purpurea* and *Glycyrrhiza glabra*) for treatment of clinical coccidiosis in broilers. *Vet Med Sci* 2023; 9(2):829-36. doi: 10.1002/vms3.971
  13. Jafari A, Zanganeh M, Kazemi Z, Lael-Monfared E, Tehrani H. Iranian healthcare professionals' knowledge, attitudes, and use of complementary and alternative medicine: a cross-sectional study. *BMC Complement Med Ther* 2021; 21(1):244. doi: 10.1186/s12906-021-03421-z
  14. James PB, Bah AJ. Awareness, use, attitude and perceived need for Complementary and Alternative Medicine (CAM) education among undergraduate pharmacy students in Sierra Leone: a descriptive cross-sectional survey. *BMC Complement Altern Med* 2014; 14:438. doi: 10.1186/1472-6882-14-438
  15. James PB, Bah AJ, Kondorvoh IM. Exploring self-use, attitude and interest to study complementary and alternative medicine (CAM) among final year undergraduate medical, pharmacy and nursing students in Sierra Leone: a comparative study. *BMC Complement Altern Med* 2016; 16:121. doi: 10.1186/s12906-016-1102-4
  16. Kemppainen LM, Kemppainen TT, Reippainen JA, Salmenniemi ST, Vuolanto PH. Use of complementary and alternative medicine in Europe: Health-related and sociodemographic determinants. *Scand J Public Health* 2018; 46(4):448-55. doi: 10.1177/1403494817733869
  17. Khan A, Ahmed ME, Aldarmahi A, Zaidi SF, Subahi AM, Al-Shaikh A, Alghamdy Z, Alhakami LA. Awareness, Self-Use, Perceptions, Beliefs, and Attitudes toward Complementary and Alternative Medicines (CAM) among Health Professional Students in King Saud bin Abdulaziz University for Health Sciences Jeddah, Saudi Arabia. *Evid Based Complement Alternat Med* 2020; 2020:7872819. doi: 10.1155/2020/7872819
  18. Lee EL, Richards N, Harrison J, Barnes J. Prevalence of use of traditional, complementary and alternative medicine by the general population: a systematic review of national studies published from 2010 to 2019. *Drug Saf* 2022; 45(7):713-35. doi: 10.1007/s40264-022-01189-w
  19. Liu L, Tang Y, Baxter GD, Yin H, Tumilty S. Complementary and alternative medicine-practice, attitudes, and knowledge among healthcare professionals in New Zealand: an integrative review. *BMC Complement Med Ther* 2021; 21(1):63. doi: 10.1186/s12906-021-03235-z
  20. De-Moraes-Mello-Boccolini P, Siqueira-Boccolini C. Prevalence of complementary and alternative medicine (CAM) use in Brazil. *BMC Complement Med Ther* 2020; 20(1):51. doi: 10.1186/s12906-020-2842-8
  21. Mortada EM. Evidence-Based Complementary and Alternative Medicine in Current Medical Practice. *Cureus* 2024; 16(1):e52041. doi: 10.7759/cureus.52041
  22. Nugraha RV, Ridwansyah H, Ghazali M, Khairani AF, Atik N. Traditional herbal medicine candidates as complementary

- treatments for COVID-19: A review of their mechanisms, pros and cons. *Evid Based Complement Alternat Med* 2020; 2020 (1):2560645. doi: 10.1155/2020/2560645
23. WHO. WHO global report on traditional and complementary medicine 2019. World Health Organization; 2019.
24. Paoloni M, Agostini F, Bernasconi S, Bona G, Cisari C, Fioranelli M, Invernizzi M, Madeo A, Matucci-Cerinic M, Migliore A, Quirino N. Information survey on the use of complementary and alternative medicine. *Medicina (Kaunas)* 2022; 58(1):125. doi: 10.3390/medicina58010125
25. Paudyal V, Sun S, Hussain R, Abutaleb MH, Hedima EW. Complementary and alternative medicines use in COVID-19: A global perspective on practice, policy and research. *Res Social Adm Pharm* 2022; 18(3):2524-2528. doi: 10.1016/j.sapharm.2021.05.004
26. Rajahthurai SD, Farrukh MJ, Makmor-Bakry M, Tan HJ, Fatokun O, Mohd-Saffian S, Ramatillah DL. Use of complementary and alternative medicine and adherence to medication therapy among stroke patients: a meta-analysis and systematic review. *Front Pharmacol* 2022; 13:870641. doi: 10.3389/fphar.2022.870641
27. Roy V, Gupta M, Ghosh RK. Perception, attitude and usage of complementary and alternative medicine among doctors and patients in a tertiary care hospital in India. *Indian J Pharmacol* 2015; 47(2):137-42. doi: 10.4103/0253-7613.153418
28. Sharp D, Lorenc A, Morris R, Feder G, Little P, Hollinghurst S, Mercer SW, MacPherson H. Complementary medicine use, views, and experiences: a national survey in England. *BJGP Open* 2018; 2(4). doi: 10.3399/bjgpopen18X101614
29. Tsai MY, Huang YC, Cheng BC, Chin CY, Hsu YT, Lee WC. Prevalence and varieties of complementary and alternative medicine usage among individuals with pre-dialysis chronic kidney disease in Taiwan: an investigative cross-sectional analysis. *BMC Complement Med Ther* 2024; 24(1):11. doi: 10.1186/s12906-023-04311-2
30. Vankova D. Knowledge, attitudes and practices (KAP) study of complementary and alternative medicine (CAM) among students and professionals: evaluating educational needs. In *EDULEARN22 Proceedings: IATED 2022*; 690-697. doi: 10.21125/EDULEARN.2022.0204
31. Yurtseven E, Vehid S, Bosat M, Sumer EC, Akdeniz SI, Cig G, Tahirebegolli B. Assessment of knowledge and attitudes toward Complementary and Alternative Medicine (CAM) amongst Turkish medical faculty students. *Afr J Tradit Complement Altern Med* 2015; 12(5):8-13. doi: 10.4314/ajtcam.v12i5.2
32. Zheng HZ, Chang TY, Peng B, Ma SQ, Zhong Z, Cao JZ, Yao L, Li M, Wang HF, Liao X. Chinese Patent Medicine as A Complementary and Alternative Therapy for Type 2 Diabetes Mellitus: A Scoping Review. *Complement Ther Med* 2024; 80: 103014. doi: 10.1016/j.ctim.2024.103014